GEOGRAPHIC SCHOOL BULLETINS

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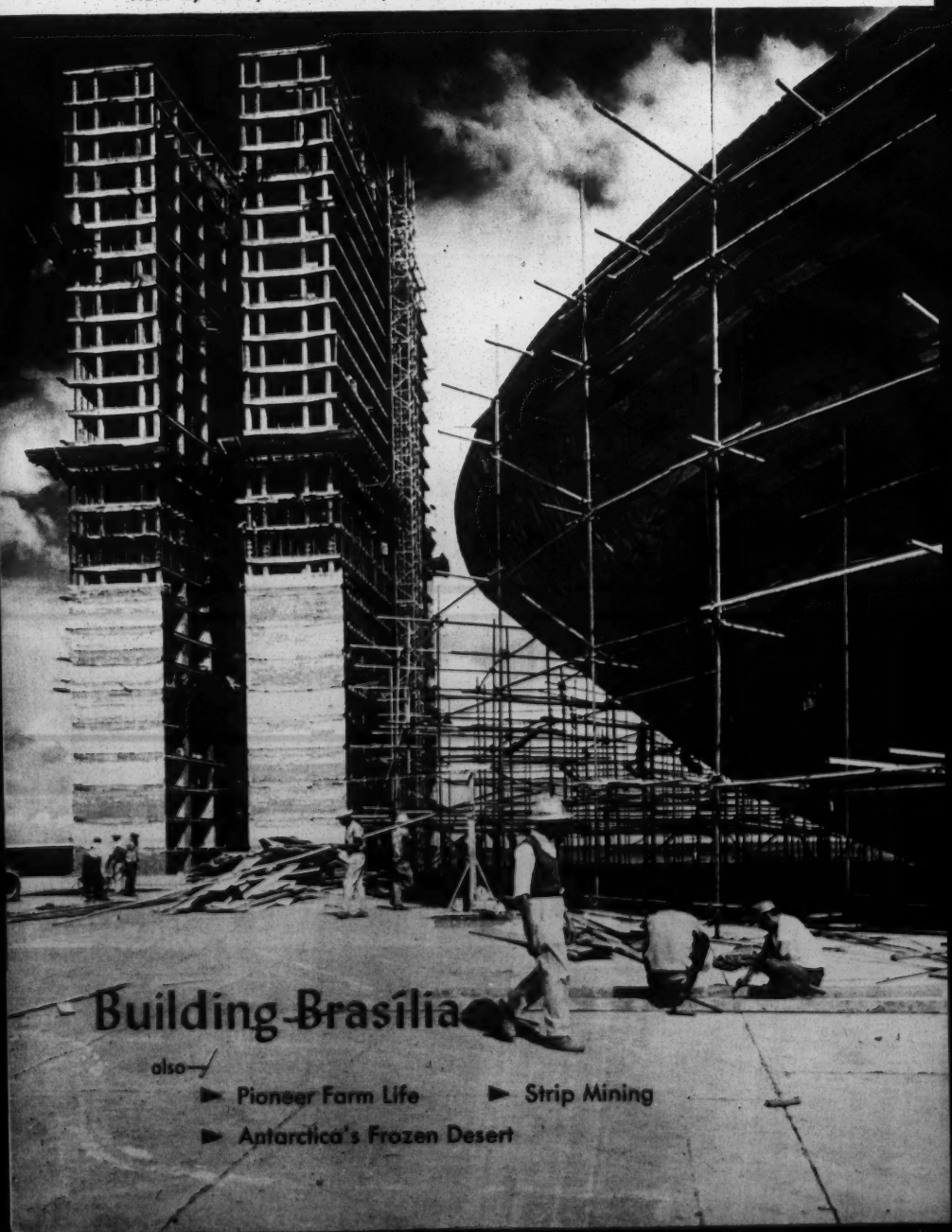

Building Brasília

also—

- Pioneer Farm Life
- Strip Mining
- Antarctica's Frozen Desert

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down so neatly it was ready for binding into sheaves. He might finish the whole two-acre field before lunch, with luck.

Later he would bind it, throw it into the oxcart, and haul it in before rain could wet it. With the harvest safely in there would be plenty of time for the tedious threshing and winnowing. He would take part of the crop to the miller to be ground into precious flour for Rose. The rest he would take to the crossroads to Sam Todd's store. He wondered what price Sam would give this year.

His thoughts were interrupted by six-year-old Moses, who appeared with a wooden piggin of cool cider Rose had thoughtfully sent out. Moses would be going to school at the crossroads as soon as the harvest was over. His older brother had been told he would have to come to school earlier than the rest and start the fire. But this had its good side too: with David doing this extra chore, Joe Lippitt would be excused from providing the cord of seasoned hardwood required of other settlers. Next year, though, it would be his turn to board the schoolmaster.

At the homestead over the hillock, Rose Lippitt was pleasantly interrupted from her work by an all-too-rare visitor. The tin

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ARTHUR P. MILLER, JR., NATIONAL GEOGRAPHIC STAFF

A PIECE OF AMERICA 150 years old: oxen plod the dirt street while a horse awaits a busy blacksmith. The shorts-clad visitors have come to the Farmers' Museum, Cooperstown, New York, to relive the days of 1800. Near by stands the restored frame house of pioneer Joseph Lippitt, a living memorial to the . . .

Frontier Farmers

By Arthur P. Miller, Jr., National Geographic Staff

JOE LIPPITT let his other boot drop to the floor with a thump.

He looked across the room at his wife, Rose, making silly noises to the baby in the trundle bed.

Despite aching muscles, Joe managed a smile. His homestead here in the virgin New York hills was taking shape. It should be, he thought. He had put two years of backbreaking work into it since he pulled up stakes in Rhode Island in 1795 and brought his family west to these undeveloped lands.

Now the house was built—all seven rooms, even a parlor. So was the log barn. Thanks to a fair shake from the summer rains, all of his crops were in good shape. The hay and oats were in the barn, the corn, barley, and wheat nearing harvest. The family would eat well over the winter that in a month or so would throw its snowy blanket over the Susquehanna Valley.

The baby was asleep now. Joe padded across the room, blew out the candle, and settled back on the cornhusk mattress. He thought: "Tomorrow, I'll . . ."

Next day, as soon as the sun had burned the dew off the fields, Joe took the graincradle off its peg in the barn and made his way out to a field of wheat. Long, sure strokes cut the grain down in swathes. With this new hickory cradle he found he could lay it

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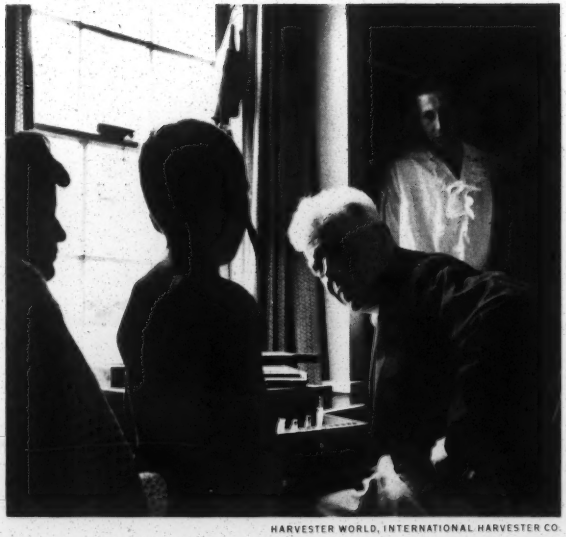
completely from his bad case of croup. The flaxseed, licorice, and sun raisin concoction Doc gave him seemed to have worked.

For a last errand, Joseph took one of the oxen to the smithy. Moses watched fascinated as the smith prodded the animal into a large wooden frame and snapped a broad leather belt under its belly. Two men heaved on a handle to lift the ox off the ground. The blacksmith, with his heavy hammer, nailed two new shoes on each cloven hoof.



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As twilight closed in, the family headed homeward, their necessities from the village tucked at their feet. As soon as they got back, Joe would head for the pasture to give the cows their second milking. Rose and the children would finish the other chores. After dinner and a story by candlelight, it would be time for bed. Tomorrow would soon dawn, and there would be much to do.

NEW YORK STATE HISTORICAL ASSOCIATION

Farmers' Museum

ON HIS CREAKY hand press, the village crossroads printer turns out an inky copy of the *Otsego Herald* of 1816. Assorted handbills attest his prowess. More than 140,000 visitors each year visit the print shop and other buildings at Cooperstown's Farmers' Museum: the one-room schoolhouse, country store, blacksmith's shop, tavern, apothecary, lawyer's office, and Lippitt homestead. Each is authentic, moved from a near-by New York village. In addition, each has a present-day occupant to show visitors around. In a stone barn stand implements devised by pioneer craftsmen: an apple parer, treadmill churn, threshers —even a rudimentary washing machine.

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peddler had come, wagon shining with his wares. She looked with a critical eye at the colander he offered for sale. As she compared it with a couple of others still hanging on the cart, she listened to a running commentary from the jovial visitor on the news from other clearings.

Back in the house, she got on with her main job—feeding and clothing this growing family. She had already skimmed the cream off the milk for butter, so she set down a saucer of milk for the cat who came bounding through the cat-hole in the molding beside the door.

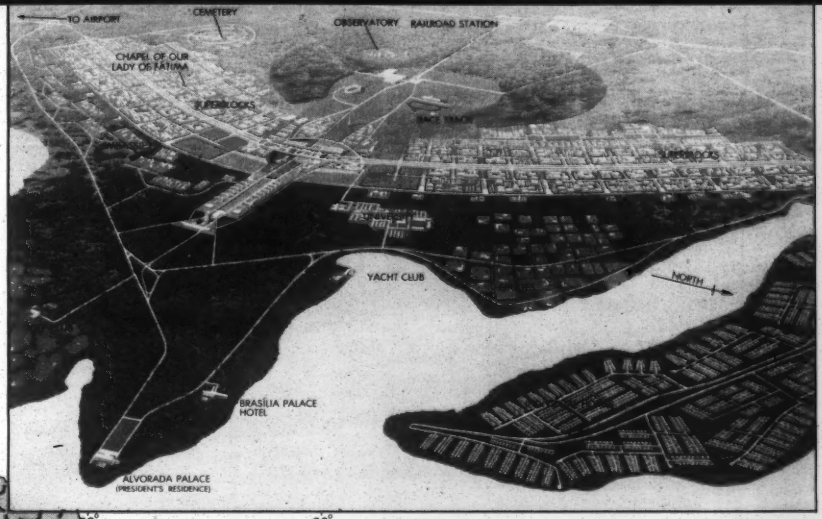
Like a good farmer's wife, she created with her hands the finished products for which her husband provided the raw materials. She transformed the milk into butter and cheese, baked flour into bread, loomed the flax and wool for breeches, shirts, bed sheets, and mittens. Into the big iron kettles over the open fire went the vegetables from the garden plot she tended behind the house. Out of the beehive oven came fresh-baked bread, cake, and cookies. On a spit she broiled her meat, saving the drippings to make candles and soap.

A trip into the village in the oxcart was an exciting family outing. The first stop was the country store where Joseph exchanged a few pounds of Rose's homemade butter and several yards of tow cloth for some salt, ginger, alum, molasses, indigo dye—and a piece of rock candy for each little Lippitt.

Rose made mental notes of other supplies to buy when the price was right: a birch broom, calico at four cents a yard, shoelaces cut from rawhide, glue, and tea. Joseph cocked his eye at ax handles made of hard-grained maple and a pair of sturdy copper-toed boots.

ARTHUR P. MILLER, JR., NATIONAL GEOGRAPHIC STAFF

Next came a stop at the apothecary shop where the Widow Dana was purchasing a fragrant pomander. Rose had once made one herself—by sticking cloves in an orange and letting it dry. Down the street at Doc Stauffer's, Rose and Joseph were relieved to learn that Moses had recovered

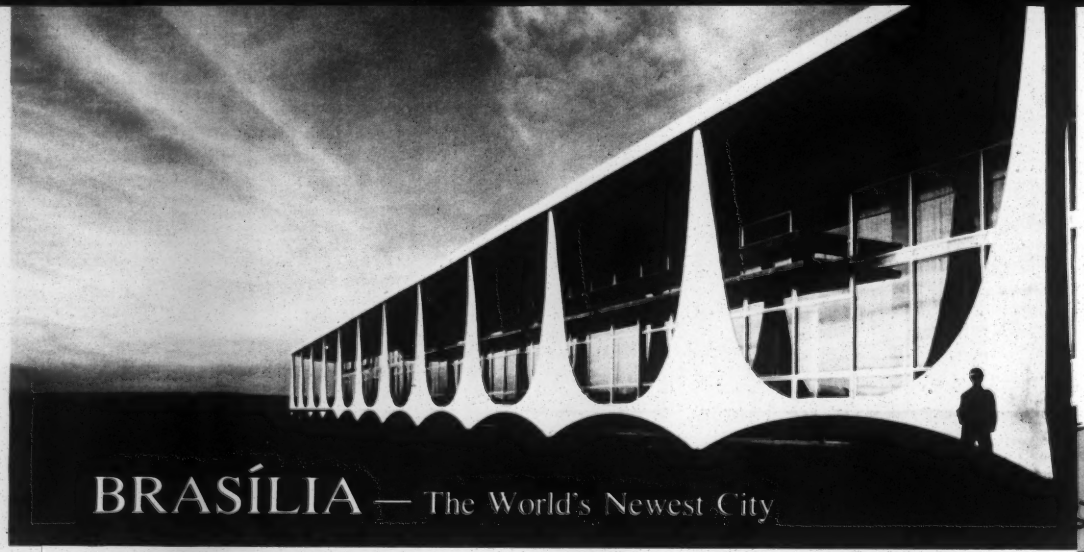


confident gamble on a nation's and a continent's future."

To accommodate half a million persons, Brasília aims at the last word in modern architecture and city planning. Traffic jams will be only memories. Overpasses will eliminate traffic lights on main arteries; offstreet parking will keep downtown avenues clear. Housing units will open their front doors on tree-shaded parks (right).

Brasília officially replaced Rio de Janeiro as the capital 11 days ago. As the paint dries in each new building, government workers will leave Rio to take up their posts in the world's newest city.

Photographs by Thomas J. Abercrombie, National Geographic Staff



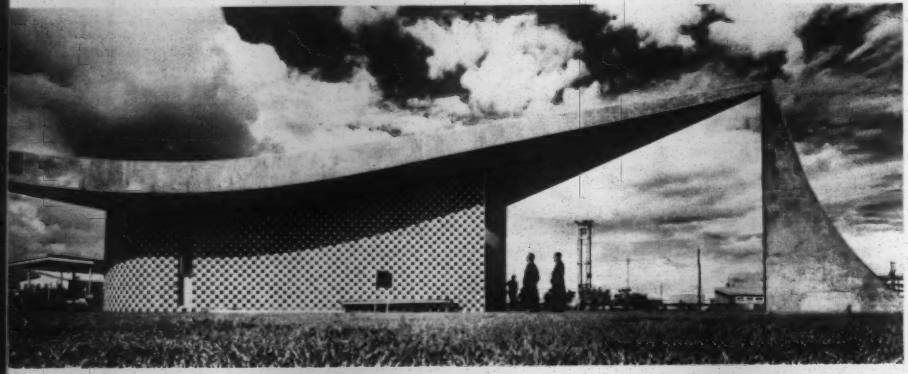
BRASÍLIA — The World's Newest City

ON AN EMPTY prairie in central Brazil, futuristic buildings have sprung up stark against the horizon.

One is Brazil's new White House, Alvorada Palace, right. Another is Our Lady of Fatima chapel, below. Both are landmarks of Brazil's new capital, Brasília.

Less than four years ago, the 2,260-square-mile Federal District was a wilderness plateau.

No road or railroad crossed it. Everything and everyone needed to build a city had to be flown in. Even asphalt for the airport runway came by plane. Once there, men and machines toiled day and night. Muddy-booted workmen cleared land and built skyscrapers. Earthmovers gouged roads in the red soil so that by the target date—April 21, 1960—at least part of the government could move in.



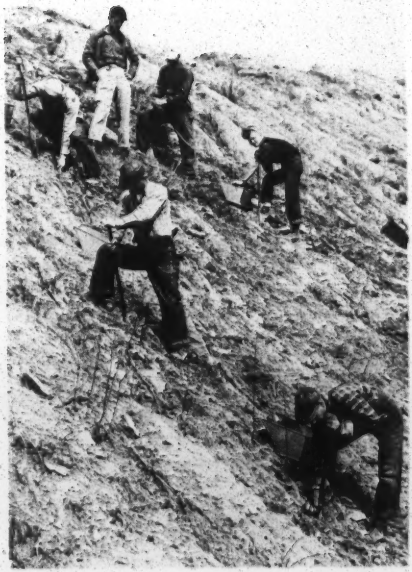
Brasília is intended to be more than a government seat. It is also planned as a magnet to draw the nation's people and energies away from the congested coast. "Brazil's rich and untapped back country is one of the world's great remaining reservoirs of wealth," writes Brazilian editor Hernane Tavares de Sá in the May, 1960 *National Geographic*. "Brasília is a daring, yet

Crops and orchards have been planted on some reclaimed lands. Former Illinois strip mines grow apples and peaches prized for distinctive flavor. The "deep plowing" turned up minerals which had been leached from the topsoil by centuries of weathering.

Texture and composition of spoil banks largely determine the use to which the land is put. Corn, beans, alfalfa, and other crops grow well on some graded banks in Illinois and West Virginia. In several Indiana reclamation projects, strip-mined land was converted to pasture to raise prized Hampshire hogs and Hereford and Angus beef cattle.

Most stripped land, too acid or too rough to support crops, is planted to trees (right). Millions of seedlings have been planted on spoil banks over the past 30-odd years and are now beginning to yield pulp wood, mine timbers, saw logs, poles, fence posts, and other forest products.

Tree-planted areas can be turned into scenic vacation spots. A program of developing strip-mined lands into recreational areas has been started, with some spoil banks converted to game refuges and State parks. Lakes formed as water collects among the spoil banks can provide swimming, boating, hunting, and fishing (below). Experts say each acre of water could produce 250 pounds of fish a year. Other ponds and reservoirs can be tapped to irrigate the new crops sprouting on reclaimed land.



PHOTOGRAPHS FROM NATIONAL COAL ASSOCIATION

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Healing the Strip Mines' Scars

By Dr. Lee Guernsey
Associate Professor of Geography, Indiana State Teachers College

THE "MOUNTAINEER" crunches a 60-cubic-yard bite of rock and coal from an open pit near Cadiz, Ohio. Similar giant shovels and draglines gobble land across the nation, wherever strip mines are in operation.

Strip mining accounts for about one-fourth of United States coal production. The heaviest concentration is in Ohio, Pennsylvania, Illinois, West Virginia, Kentucky, and Indiana.

It is a relatively simple process to use shovels and draglines to expose coal deposits from the surface and strip the coal from the shallow seams. Underground mining methods would be impossible or too expensive. Strip mining requires no costly ventilation, underground trackage, or timbering. Labor costs are less, working conditions safer, and less coal is wasted.

However, the picture is not entirely rosy. By turning the earth upside down with the topsoil dumped under the lifeless subsoil, strip mining leaves behind man-made badlands—saw-toothed profiles of desolate valleys and hills—called spoil banks. Rugged and barren, they blight the landscape and erode easily. Strip mining has built some 400,000 acres of these spoil banks throughout various States.

In many States—led by Indiana where trees were planted on strip-mined land as early as 1918—coal companies are reclaiming the spoil banks and putting them back to work producing crops. Most strip-mined land was once farmland. The coal companies often grade the peaks or reduce the spoil banks to gently rolling contours so farm machinery can operate on them. In some States, trees are planted on ungraded spoil banks.

marked stakes is one way. Another is to measure "solidified snowfall"—ice. Glaciologists sliced cross-sections representing 15 to 20 years from the wall of an ice pit. Examining the compressed layers, they derived the average yearly water equivalent of the ice —two to three inches. This, they computed, equals seven to eight inches of snowfall, about the same amount indicated by stake measurements.

Though little snow falls on Antarctica, few places are free from it. One such place is Marble Point, "perhaps the most promising piece of real estate in all of Antarctica's 5,500,000 square miles," according to Frederick G. Vosburgh, a Vice President of the National Geographic Society who recently visited the South Polar regions as a guest of the U. S. Navy.

"Marble Point is the only spot yet found in Antarctica where engineers have pronounced it practicable to build a dry-land international airport," he observes in a report to the Society.

"It was here, on January 31, 1958, that the first wheels-on-dirt landing in Antarctica was made by a single-engine *Otter* plane carrying Rear Admiral George J. Dufek, U.S.N., and Sir Edmund Hillary of New Zealand, with Commander Vernon J. Coley, U.S.N., at the controls.

"In the same type of plane, we flew there last February from McMurdo Naval Air Facility, 45 miles away.

"Glaciers planed the ground almost to sea level and receded at some unknown time in the past. Their white tongues hang in the valleys above the gray-black dirt and rock of the site.

"Dry 'snow-eater' winds, warmed by their descent from high mountains, keep snow to a minimum, as on the east slopes of the Rockies.

"Fortunately for future air travelers, the airport site lies in the midst of enough fascinating historical relics, strange wildlife, and spectacular moun-

BESIDE A SURVEYOR'S CAIRN, Frederick G. Vosburgh of the *National Geographic* examines Antarctica's snow-free Marble Point. Small planes like the *Otter* in the background land on this 1,700-foot strip. A Navy survey has shown that a large dry-land airport could be built here, though at extremely high cost.

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THOMAS J. ABERCROMBIE, NATIONAL GEOGRAPHIC STAFF

ANTARCTICA: *Desert in Disguise*

STRANGE AS IT SEEMS, less snow falls at the South Pole in an average year than fell in a single week last winter on such temperate-zone cities as Washington, D. C., and Baltimore, Maryland.

From snow measurements and studies of layers of ice laid down year by year like tree rings, American scientists at the South Pole Station (above) have found that snowfall averages only seven to eight inches a year. This equals two to three inches of rain, scarcely more than dampens the dusty Sahara.

Says Albert P. Crary, Chief Scientist of the U. S. Antarctic Research Program of the National Science Foundation, "Antarctica is a drought area." In fact it is the world's largest desert.

How then, you ask, do you explain the fact that snow and ice are piled up on the Antarctic icecap to a depth of two miles or more?

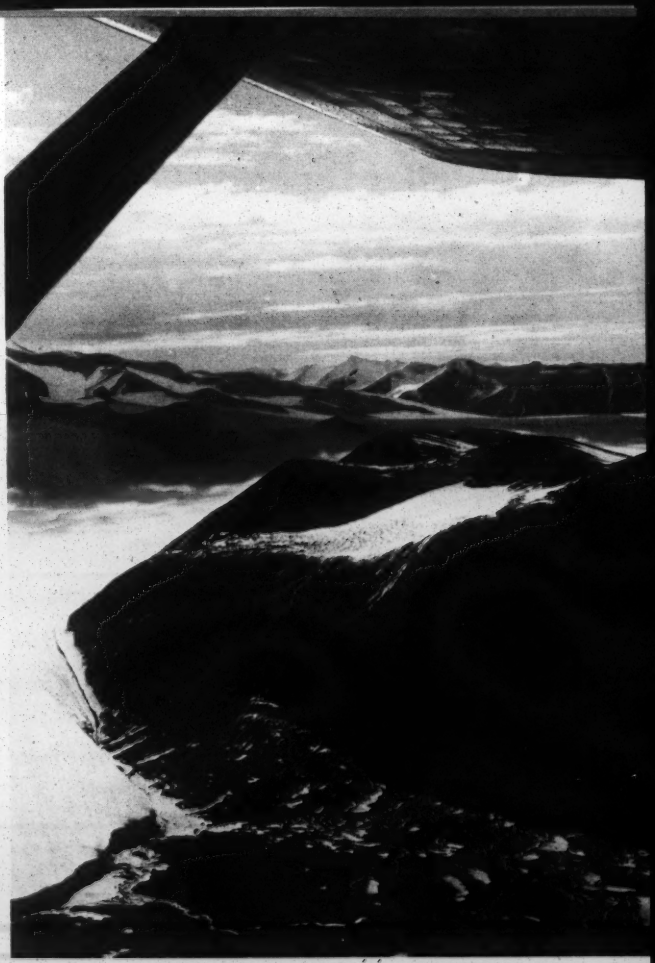
The answer is time—the slow accumulation of snow through the ages of geologic time—and the fact that at the South Pole none of the snow that falls ever melts. Temperatures average minus 56 degrees Fahrenheit as revealed by the thermometers being examined by the meteorologist in the photograph. On the warmest day in three years the mercury rose to only five-and-one-half degrees above zero.

First to report on precipitation at the Pole was Dr. Paul Siple, scientific leader in the history-making winter of 1956-57.

"We were surprised at how little total accumulation of snow there seemed to be," he observed in "Man's First Winter at the South Pole," in the April, 1958, *National Geographic*. "Snow accumulation in the 10 months from February to November seemed to total only about six inches."

Two subsequent years of measurements at the Pole support Dr. Siple's estimate.

Measuring actual snowfall with



TONGUE OF ICE licks Taylor Dry Valley, near McMurdo Sound. Unlike most glaciers in Antarctica, those overhanging this valley have not advanced for centuries. From dating of mummified seal carcasses (below) found in the valley, scientists have proved that the floor has been ice free for at least 1,500 years. Erosion, evaporation, and summer melt, they theorize, have kept the skyscraper-high ice face at a standstill.

Thaw water collects in a stream to crease the barren terrain. Algae make a half-hearted attempt to provide vegetation. This remarkable valley, with its spectacular scenery, lies near Marble Point, where Admiral Dufek and others envision some day a great international airport.

FREDERICK G. VOSBURGH; TROY L. PÉWÉ, UNIVERSITY OF ALASKA, BELOW

tain scenery to make a great national or international park.

"Standing here, one can easily envision the day when planes plying between continents of the Southern Hemisphere will be landing at Marble Point, and passengers will be stopping over to see such sights as the Taylor Dry Valley, the Ferrar Glacier, and the colony of comical Adélie penguins at Cape Royds. All are only a few minutes away by light plane or helicopter.

"The stumbling block to building a dry-land airport and ship-mooring pier at Marble Point is the cost, many millions of dollars. But the cost might not prove insuperable if the problem were attacked on an international basis. Admiral Dufek has predicted the eventual coming of cruise ships and tourist flights.

"Most important of all, such an airport would end forever the isolation of Antarctica, cut off entirely from the rest of the world for six months of the year, and would speed its scientific exploration."

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